

The nature of information used in making clinical decisions in general practice

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SUMMARY. This preliminary study indicates that in general practice:

(1) Acquisition of appropriate clinical information is more often than not dependent on prior information of a highly selected kind available economically only to a personal doctor.

(2) The amount of previous information which could be stored outside the brains of a personal doctor and his patient is relatively enormous and almost unlimited.

(3) But, the amount of this externally stored previous information which will ever be used, referred to, or be clinically useful is minimal.

(4) Logic branching systems for obtaining this essential clinical information for each episode are of two kinds. There is first the system which is universally appropriate to all patients and all diseases as a whole, a field in which the computer is becoming pre-eminent, but which also has its limitations. Secondly there is the highly personalised system, constituted by the clinical dialogue of the patient and his personal doctor, the structure of which, at present, defies any simplification and which we abandon at our peril.

(5) Continuing care by group-practice teams operating under one roof eliminates the need for fragmentation of primary clinical records.

(6) A simple up-dated manually-prepared paper summary of clinical problems encountered and therapeutic activity taken, may well be the essential core of this shared record. This would be backed up by the *ad hoc* clinical records of each health care professional as accessible, second level archives, conforming to some simple, systematic and universally accepted structure (Bjorn and Cross, 1970).

It would be of great interest to know whether or not the same conclusions would be drawn from a similar study of the selected clinical problems which are dealt with by the hospital-based specialist services.

Introduction

The advent of computers, with their relatively enormous and accessible data-storage capacity, has led to a reappraisal, not only of record systems in clinical medicine in particular, but of the whole system of medical care as well. It is clear that computer-based systems have economic as well as technical advantages over conventional record systems for research, whether clinical or operational, and for administrative purposes, but it is in the field of solving clinical problems that doubts remain. The Achilles heel of all computer-based systems is data-input, and clinical medicine is no exception.

In the limited field of clinical computer-assisted diagnosis, the possible benefits are apparent, but not yet overwhelmingly demonstrated.

Aim

It is necessary to find out if the information necessary for effectively solving a clinical problem can be made accessible before the actual problem occurs and whether a data store of this information can be created so that questions likely to be encountered can be even partially answered from it.

Is the information required for solving clinical problems so *ad hoc* that no effective store of this kind is possible? Clinical problems may only be solved or largely solved from information generated at the time at which the problem arises.

Method

To attempt to resolve this, the Birmingham Research Unit of the Royal College of General Practitioners initiated a study in which 48 general practitioners took part. Each reported on 20–25 unselected representative clinical problems, indicating on a proforma whether the information needed was acquired:

- (1) By word of mouth from the patient,
- (2) From the personal knowledge of the general practitioner and stored in the doctor's surgery,
- (3) From information contained in his clinical records, in reports of investigations which the practitioner had himself initiated, from consultants, other reports, or sources of information.

Results

In the text the results are given for initial consultations while those for initial and subsequent consultations combined are given in brackets. Of the total of 480 (1,187) consultations (table 1), 158 (195) were dealt with using only information supplied by the patient or his relatives, a further 38 (144) required no more than the addition of the part knowledge of the practitioner, without reference to his records.

A further 242 (680) required reference to his notes. Most of these references were

TABLE 1
THE USE OF PREVIOUSLY RECORDED DATA IN GENERAL PRACTICE

	<i>First consultations</i>	<i>All consultations</i>
Patient's or relatives' history only	158	195
+ Past knowledge of practitioners without reference to any written records	38	144
+ Own records or reports from direct access diagnostic procedures	242	680
Total of above	438	1019
+ Consultant's reports	42	168
	480	1187

There were 13 other records which practitioners would have liked, but were not available. There were 41 other records which practitioners would have liked to have seen, but which were not available. Of these 20 related to the practitioner's own observation, 11 to diagnostic procedures, and ten to consultants' reports.

to records made earlier during the current illness and did not relate to the more remote part. In only 42 (168) instances was reference made to a report or document initiated by someone other than the practitioner. Of the 42 (168), a large minority were to reports of diagnostic radiography to which some general practitioners in Great Britain still do not have direct access. There were only 13 (41) occasions on which the general practitioner would have liked some information which might have been available but was not.

Table 2 shows the numbers of documents or reports consulted from all those available. No attempt was made to count the volume of the practitioner's own manuscript notes.

TABLE 2
TOTAL ITEMS OF RECORDED DATA

	<i>First consultations</i>		<i>All consultations</i>	
	<i>Number consulted</i>	<i>Total documents available</i>	<i>Number consulted</i>	<i>Total documents available</i>
Own/other practitioners' records	269	1,162	801	3,528
Clinical pathology reports	14	209	84	1,178
Radiography and mass X-ray	15	163	51	616
Other diagnostic procedures	2	21	7	96
Consultant or other hospital doctors' reports	42	1,637	168	5,810
Other doctors' letters	1	70	7	291
Total	343	3,343	1,118	11,519
Total records available (including own or other practitioners' records)			11,519	

These results must be considered against the total experience of illness. On average, each of us during his three score years and ten, will become aware of about 400 aberrations from normal health and well-being and consider himself 'ill'. Approximately 100 of these 'illnesses' will be brought to a medical care agency. Only about five or ten will be in any way classifiable as life-threatening or serious. It is against this setting that we must interpret the findings.

The results (and, in particular, the frequency with which the practitioner recognises the need for information which might have been available, but was not) make it clear that this self-selected group of general practitioners in Great Britain, in making their clinical decisions, rely mainly on information generated *de novo* during the consultation. This is most obvious for the primary assessment of new problems.

It is also clear that most of the information already included in conventional record systems is superfluous and redundant. What selection of information, from the total generated during each clinical problem, is appropriate or worthy of permanent storage remains an unanswered question. Many more detailed studies are indicated, but it is suspected from this initial study that only a small part of the information mobilised for the solution of each clinical problem can be worthy of permanent storage.

In addition, only a small part of the information found necessary could ever have been stored *a priori*. It would be of interest to know whether or not the same conclusions could be drawn from a similar study of the selected clinical problems which are dealt with by the hospital-based specialist services.

Discussion

Alternative interpretation

Another interpretation is possible, however, which cannot be ignored. General practitioners still bring (7" x 5"), five-minute approach to their clinical problems and many of them have become conditioned to working without detailed recorded or documented data. The need to refer to such data is rising as the level of sophistication of general practice increases. This need can only be estimated as a projection rather than a measurement of the quantity of present-day activity.

Practical applications

The important items of information for clinical purposes are firstly a listing of the clinical problems previously brought to the patients' doctors and secondly, the therapeutic action taken in each instance. The first includes more than the formal diagnosis and the latter more than the drugs prescribed.

The personal recorded notes of the practitioner resemble a set of 'nodes' from which, in the future, methods of clinical assessment highly appropriate to the individual patient can be derived.

Apart from the list of previous problems and appropriate treatments, examples of such 'nodes' are comments such as 'fussy wife', 'dirty house', 'drinks too much', 'always complains of physical illness when depressed', and so on. These highly selected, relevant and appropriate observations, interacting with other information in the mind of the practitioner, will generate an enormous range of background information about a person who has been the patient of one doctor for any length of time. The information generated at any consultation, from the total possible, will always be guided by the patient's problem and the content of the consultation. The patient's own history to begin with, and the information abstracted subsequently during the dialogue with the practitioner will give it substance.

This simple updated clinical summary would be backed by the more conventional *ad hoc* clinical records produced at the time of each successive problem. These, as a second level archive type record, would be made more accessible if conforming to some simple but systematic structuring (Bjorn and Cross, 1970).

Structured records of this type, stimulated by the work of Weed (1969), were first designed in response to the confidently expected benefits attributable to automated systems and available only from automated systems (Preece, 1972). However, the work of these pioneers has made it clear that the principles can be applied equally to conventional, manually up-dated paper records.

The clinical dialogue between the patient and the practitioner, on which the assessment is based, is equivalent to the logic-branching systems on which computer assisted diagnostic programmes are designed. The personal doctor, however, brings his own personal programme of logic-branching thought to each diagnostic situation.

Computer-assisted systems using a logic-branching diagnostic approach will have a demonstrably powerful pay-off in so far as they provide information about patients and illnesses in general. However, the personal doctor will always have an essential place in the matching of general diagnostic programmes to the unique clinical history of an individual patient. The field where this is of greatest importance, is in the clinical assessment and relative weighting of the organic and emotional components of a particular clinical problem.

The findings suggest that an integrated computer-based clinical information system for each patient may well turn out to be a much simpler affair than first supposed and that its contributions to clinical problem-solving will be proportionately smaller.

The contribution of computer-based systems to problem-solving may well lie in indicating the topics in which to look for information, and the means by which it might be sought, rather than solely by the provision of an accessible automated store of detailed information about any one patient. For example, it might be used to indicate certain prognostic or potential risk groups.

It is clear from this rather simple analysis that any data bank will need to fulfil two impossible conditions. Firstly, it will never contain all the information needed for solving new problems, because the bulk of this information has to be generated *de novo* at the time of clinical assessment. Secondly, the information which the bank will need to contain, to cover all possible needs even for this very limited purpose, will be enormous, and over the lifetime of the patient most of it will be redundant.

Not only must the origin of the clinical data used in decision-making determine the structure of the record system used in medical care, but so also will the pathways by which this information has to be transmitted between participants in the system of medical care. A structure of community care is evolving in which those who supply nursing, social, and clinical care to a defined group of 15–25,000 patients are housed under one group-practice roof. This arrangement tends increasingly towards an arrangement whereby one record is shared by them all. This may well take the form of a paper record filed at the group-practice centre, with highly selected components only admitted to some central automated information system.

Furthermore, the trend towards presymptomatic diagnosis, screening campaigns, and health education organised from practice centres will require that there must be records at this level. The only information that must, of necessity, leave the practice centre concerns the referral of patients for specialist and consultant opinion. It will be essential to analyse this material also, and investigation may reveal that this, too, shares the *ad hoc* character of the data used in primary clinical decision-making.

The reasons for the limitations of computer-based systems in the particular field of medical records are related to the requirements of the system as a whole. The recognition of these limitations makes it essential to adopt a 'general systems' approach and examine the problem as one entity.

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NEED FOR SUPERVISION IN THE ELDERLY RECEIVING LONG-TERM PRESCRIBED MEDICATION

Summary

Medication for 127 randomly selected patients aged over 70 in a large group practice was examined in relation to the available supervision for this treatment. About half the patients were on long-term treatment, mainly drugs associated with heart disease, depression, or anxiety. Nineteen had had no recorded contact with the family doctor for six months or longer, and examination by nurse surveillance suggested that three might be suffering from drug toxicity. It was concluded that reliance on self-referral by elderly patients was unsafe.

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